

### ABSTRACT

A solid oxide regenerative fuel cell includes a ceramic electrolyte, a first electrode which is adapted to be positively biased when the fuel cell operates in a fuel cell mode and in an electrolysis mode, and a second electrode which is adapted to be negatively biased when the fuel cell operates in the fuel cell mode and in the electrolysis mode. The second electrode comprises less than 1 mg/cm<sup>2</sup> of noble metal. By maintaining a reducing atmosphere on the second electrode at all times noble metals can be eliminated from the electrode composition which substantially reduces the cost of the fuel cell.